Tobacco Use and Associated Health Conditions and Risk Factors in the Lesbian, Gay, Bisexual, Transgender, and Transsexual Populations of Puerto Rico, 2013–2015

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Objective: The objectives of this research were to develop an epidemiological profile of tobacco use in the Puerto Rico lesbian, gay, bisexual, transgender, and transsexual (LGBTT) populations and identify whether there are any statistically significant differences (in terms of health conditions and risk factors) between LGBTT smokers (LGBTT-S), LGBTT non-smokers (LGBTT-NS), general-populationnon-smokers (GP-NS), and general-population smokers (GP-S).

Methods: Using the Puerto Rico Behavioral Risk Factor Surveillance System database (2013–2015), we conducted a univariate analysis to obtain an epidemiological profile, and a bivariate analysis was performed to compare LGBTT-S, LGBTT-NS, GP-NS, and GP-S. Finally, to determine the odds ratios (ORs), an age-adjusted logistic regression model with a 95% level of reliability was used.

Results: During the period of 2013 through 2015, the Puerto Rico LGBTT population was reported to have a higher tobacco use prevalence than the general-population had (21.6% vs. 10.8%). The LGBTT-S were more likely to have depression (OR: 2.63, p = 0.030) than the LGBTT-NS were. Likewise, LGBTT-S were more likely to suffer from COPD (OR: 4.81, p = 0.014), depression (OR: 3.27, p = 0.002), and heart attack (OR: 0.12, p = 0.038) than were GP-NS. Finally, LGBTT-S were more likely to suffer from COPD (OR: 5.07, p = 0.013) and heart attack (OR: 0.13, p = 0.046) than GP-S were.

Conclusion: The results of this research demonstrate that tobacco use is one of the most critical public health issues affecting the LGBTT populations in Puerto Rico. For that reason, specific interventions and treatments directed to LGBTT populations are needed to help to reduce the impact of this addiction on the health of their members. [*P R Health Sci J 2019;38:46-53*]

Key words: LGBTT smokers, LGBTTs and tobacco, Puerto Rico LGBTTs, LGBTT health, Hispanic LGBTTs

During the last 2 decades, the visibility of the lesbian, gay, bisexual, transgender, and transsexual (LGBTT) population has increased dramatically in different levels of society. However, the social conditions and public acceptance of this population have improved slowly. There is limited knowledge regarding the health status of LGBTT populations. Up to now, the health care system has approached the health of LGBTT individuals as being a function of their sexual practices, though also considering issues of identity and orientation (1). For that reason, the members of this population still face high levels of health disparities in multiple areas (2).

However, in the last decade, emerging scientific literature has been demonstrating that the LGBTT population requires specific attention in terms of health disparities (3). For example, lesbians and bisexual women are more likely to be overweight or obese than are their heterosexual counterparts (4), increasing the risk of heart disease in the former (4). Tobacco and alcohol use are major risk factors for heart disease among men, and these behaviors are prevalent among gay men (4). Transgender and transsexual individuals have a high prevalence of mental health issues and are not likely to have health insurance (3). Likewise, compared with the general-population, LGBTT populations have the highest rates of alcohol, tobacco, and drug use (3).

Tobacco use is a critical health issue in the United States LGBTT population. Annually, this population spends $7.9

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The author/s has/have no conflict/s of interest to disclose.

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billion on cigarettes (5). In 2009, a systematic review showed a positive association between being a member of a sexual or gender minority and cigarette use, with an odds ratios (ORs) of from 1.5 to 2.5 (6). Likewise, the 2012–2013 National Adult Tobacco Survey demonstrated that the prevalence of cigarette smoking in the United States was 30.8% for LGBT adults and 20.5% for heterosexual adults (7, 8). The 2014 National Health Interview Survey reported that 23.9% of LGBT adults smoked cigarettes, in comparison with 16.6% of heterosexual adults (9, 10). Despite the above, tobacco control is not a visible priority for LGBT organizations (11).

In 2006, with the approval of Act No. 66, which amended Act No. 40 of August 3, 1993 (law to regulate smoking in certain public and private places), Puerto Rico became one of the jurisdictions in the United States with the most restrictive policies to control tobacco use and protect against secondhand-smoke exposure (12). Despite the progress in tobacco control, Puerto Rico did not have population-based data on tobacco use in the LGBTT population. For this reason, in 2011, the Puerto Rico Tobacco Control Program, with the help of local LGBTT tobacco-control advocates, was able to see that 2 questions, 1 on gender identity and the other on sexual orientation, were included on the Puerto Rico Behavioral Risk Factor Surveillance System questionnaire.

The main objective of the study described herein was to build an epidemiological profile of tobacco use in the Puerto Rico LGBTT population for the period of 2013 through 2015. In addition, to have a clear picture of where we should direct future research (as well as smoking-cessation interventions) in this population, our secondary objective was to identify the existence of statistically significant differences—in terms of health conditions and risk factors—between LGBTT smokers (LGBTT-S), LGBTT non-smokers (LGBTT-NS), general-population non-smokers (GP-NS), and general-population smokers (GP-S).

Materials and Methods

Employing a cross-sectional study, we conducted a secondary data analysis of the Puerto Rico Behavioral Risk Factor Surveillance System database for the period of 2013 through 2015, using the Statistical Package for the Social Sciences (SPSS, IBM Corp. Released 2010. IBM SPSS Statistics for Windows, Version 19.0. Armonk, NY: IBM Corp.) and Stata (StataCorp. 2015. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP). The Behavioral Risk Factor Surveillance System is a population-based telephone survey funded by the Centers for Disease Control and Prevention (CDC) and carried out in all 50 states and 5 territories of the United States. This annual survey interviews more than 350,000 noninstitutionalized adults of 18 years of age and over. The Behavioral Risk Factor Surveillance System collects information about sociodemographics, health conditions, and tobacco and alcohol use, among other personal characteristics; in Puerto Rico, the survey began in 1996, under the Puerto Rico Department of Health. During 2011, 2 major changes were implemented in the Behavioral Risk Factor Surveillance System. One of these changes was the inclusion of cell phones in the sampling, and the other change was the incorporation of a new weighting method (raking). These changes were made with the purpose of increasing the coverage of the survey and to minimize the nonresponse selection bias (13).

Members of the LGBTT population were identified with 2 questions. The first question was related to gender identity and was formulated as follows (Table 1): *Which of the following best describes your gender?* The refusal rate for this question was 0.1%. The second question was related to sexual orientation and was formulated as follows (Table 1): *Which of the following best describes your sexual orientation?* The refusal rate for this question was 0.7%. The construction of the LGBTT variable was accomplished using the gender identity and sexual-orientation questions. We considered people who identified themselves as lesbian, gay, bisexual, transgender, or transsexual as being part of the LGBTT population; the remaining individuals were considered to be non-LGBTT (Table 1).

To analyze the 3 years of data, a new weight variable was created. The new variable was calculated by dividing the weighting variable that the CDC created in the 3 years under study. After performing the weighting for the period of 2013 through 2015, an univariate analysis was performed to calculate frequency distributions for the variables under study. The purpose of this analysis was to obtain an epidemiological profile of the people in the LGBTT populations who use tobacco. LGBTT-S were compared with LGBTT-NS, GP-NS, and GP-S to identify statistically significant differences in terms of health conditions and risk factors. Finally, to determine the ORs, an age-adjusted logistic regression model with a 95% level of reliability was used.

Results

During the period of 2013 through 2015, 1.8% (48,980) of people 18 years of age and over identified themselves as being part of the LGBTT population. According to the data, 51.3% of this group said they were gay, 25.4%, bisexual, 16.8%, lesbian, 5.3%, transgender, and 1.3%, transsexual.

The Puerto Rico LGBTT population had a higher prevalence of tobacco use compared to that of the general-population (21.6% vs. 10.8%) (Figure 1). In the LGBTT population in Puerto Rico, the following groups had the highest prevalence of tobacco use: that consisting of 25-to-34-year-olds (29.7%), that whose members had attended or were attending college or technical school (25.5%), that made up of individuals with an annual income of $25,000 to $34,999 (36.4%), and that consisting of people who had been unemployed for more than 1 year (48.4%) (Table 2). Likewise, tobacco use prevalence was analyzed for the different groups of the LGBTT population, and the group with highest tobacco

Table 1. Variable definitions

Variable	Question	Categories	
Age	Six-level imputed age category	1 – Age 18 to 24 2 – Age 25 to 34 3 – Age 35 – 44	4 – Age 45 – 54 5 – Age 55 – 64 6 – Age 65 or older
Education	Level of education completed	1 – Did not complete high school 2 – Completed high school 3 – Attended college or technical school 4 – Graduated from college or technical school	
Income	Annual income	1 – Less than $15,000 2 – $15,000 to 24,999 3 – $25,000 to 34,999	4 – $35,000 to 49,999 5 – $50,000 or more
Sex	Are you …?	1 – Male 2 – Female	
Gender	Which of the following best describes your gender?	1 – Male 2 – Female 3 – Transgender	4 – Transsexual 9 – Refused to answer
Sexual orientation	Which of the following best describes your sexual orientation?	1 – Heterosexual/straight 2 – Homosexual/gay 9 – Refused to answer	3 – Lesbian 4 – Bisexual
Employment	What is your current employment status?	1 – Employed for wages 2 – Self-employed 3 – Out of work for more than 1 year 4 – Out of work for less than 1 year 5 – Homemaker 6 – Student 7 – Retired 8 – Unable to work	
Heavy drinkers	Hare you a heavy drinker (i.e., an adult man having more than two drinks per day or an adult woman having more than one drink per day)	1 – No 2 – Yes	
BMI	Four categories of body mass index (BMI)	1 – Underweight 2 – Normal weight	3 – Overweight 4 – Obese
Depression	(Ever told) you that you have a depressive disorder, including depression, major depression, dysthymia, or minor depression?	1 – Yes 2 – No	
Asthma	(Ever told) you had asthma?	1 – Yes	2 – No
COPD	(Ever told) you have chronic obstructive pulmonary disease (COPD), emphysema, or chronic bronchitis?	1 – Yes 2 – No	
Heart disease	(Ever told) you had angina or coronary heart disease?	1 – Yes 2 – No	
Arthritis	(Ever told) you have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia? (Arthritis diagnoses include rheumatism, polymyalgia rheumatic; osteoarthritis [not osteoporosis]; tendonitis, bursitis, bunion, tennis elbow; carpal tunnel syndrome, tarsal tunnel syndrome; joint infection, etc.)	1 – Yes 2 – No	
Diabetes	(Ever told) you have diabetes (If "Yes" and respondent is female, ask "Was this only when you were pregnant?" If respondent says pre-diabetes or borderline diabetes, use response code 4.)	1 – Yes 2 – No	
Stroke	(Ever told) you had a stroke.	1 – Yes	2 – No
Kidney	(Ever told) you have kidney disease. Do NOT include kidney stones, bladder infection, or incontinence. (Incontinence is not being able to control urine flow.)	1 – Yes 2 – No	
Heart attack	(Ever told) you had a heart attack, also called a myocardial infarction.	1 – Yes	2 – No
LGBTT	The construction of the LGBTT variable was performed using gender identity and sexual orientation variables. We considered the people who identified themselves as lesbian, gay, bisexual, transgender or transsexual to be part of the LGBTT population. Likewise, the remaining individuals were considered to be non-LGBTT.	1 – Non LGBTT 2 – LGBTT	
General health	Would you say that in general your health is	1 – Excellent 2 – Very good 3 – Good	4 – Fair 5 – Poor
FCD	Do you smoke the first cigarettes of the day in the first half hour after waking up?	1 – Yes 2 – No	
Health insurance	What type of health insurance do you have?	1 – Puerto Rico health reform (Mi Salud) 2 – Private insurance (commercial) 3 – I don't have health insurance 7 – Don't know/Not sure 9 – Refused	

use prevalence was that composed of transgender individuals with 34.1%, followed by those comprising individuals who self-identified as gay (23.5%), as lesbian (22.5%), or as bisexual (19.5%) (Figure 1). It is important to mention that no one in the transsexual population mentioned using tobacco. Other sociodemographic variables were analyzed in terms of tobacco use prevalence for the different groups within the LGBTT population (Table 2).

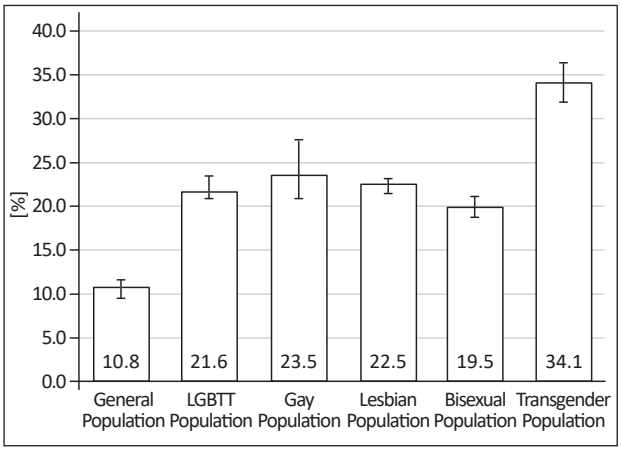

Figure 1. Tobaco use prevalence 2013-2015

In terms of health insurance, only 7.1% of the members of the LGBTT population were uninsured; regarding overall health, 27.6% perceived themselves to be in fair to poor health. The most prevalent health condition or risk factor in the LGBTT population was overweight or obesity (56.0%). In LGBTT-S, 5.7% did not have health insurance, and 45.3% reported that they had fair or poor general health (Table 3). The most prevalent health condition in LGBTT-S was overweight or obesity (53.3%) (Table 3). In terms of risk factors, the most prevalent was the time of the first cigarette (TTFC) of the day, which is an objective measure of nicotine dependence. The results of our study revealed that the 53.6% of LGBTT-S reported that they smoked the first cigarette of the day during the first half hour after waking up (Table 3). Other health variables and risk factors were analyzed in terms of tobacco use prevalence for the different groups of the LGBTT population (Table 3). As we mentioned before, no one in the transsexual population admitted to using tobacco.

Table 2. Tobacco use prevalence by sociodemographic characteristics, 2013–2015*

Variable	LGBTT**			Gay			Bisexual			Lesbian			Transgender		
	N	Yes		N	Yes		N	Yes		N	Yes		N	Yes	
		#	%		#	%		#	%		#	%		#	%
Age															
18 – 24 years	14,263	2,952	20.7	8,276	1,688	20.4	4,479	573	12.8	1,508	692	45.9	0	0	0.0
25 – 34 years	10,517	3,124	29.7	6,668	2,114	31.7	2,137	821	38.4	1,340	189	14.1	1,175	804	68.4
35 – 44 years	8,817	2,010	22.8	3,876	1,430	36.9	2,791	343	12.3	1,908	239	12.5	157	0	0.0
45 – 54 years	8,333	1,808	21.7	4,141	671	16.2	1,298	376	29.0	2,595	763	29.4	458	0	0.0
55 – 64 years	4,452	245	5.5	2,317	146	6.3	1,490	98	6.6	471	0	0.0	173	0	0.0
65+ years	2,598	400	15.4	924	121	13.1	336	202	60.1	547	0	0.0	623	78	12.5
Level of education															
Did not complete high school	7,276	931	12.8	2,327	435	18.7	3,616	492	13.6	777	0	0.0	305	0	0.0
Completed high school	11,512	2,740	23.8	6,997	1,455	20.8	3,170	1,043	32.9	1,188	234	19.7	157	0	0.0
Attended college or technical school	14,208	3,623	25.5	8,197	2,344	28.6	2,323	353	15.2	2,945	842	28.6	902	78	8.6
Graduated from college or technical school	15,984	3,277	20.5	8,682	1,936	22.3	3,422	524	15.3	3,462	810	23.4	1,222	804	65.8
Annual income															
Less than $15,000	18,719	4,979	26.6	8,549	3,214	37.6	5,551	1,027	18.5	3,848	739	19.2	520	0	0.0
$15,000 to 24,999	10,822	1,786	16.5	6,599	706	10.7	1,860	536	28.8	2,038	540	26.5	325	0	0.0
$25,000 to 34,999	5,628	2,049	36.4	3,754	1,678	44.7	741	0	0.0	871	372	42.7	1,224	804	65.7
$35,000 to 49,999	3,556	501	14.1	1,803	0	0.0	1,446	372	25.7	307	129	42.0	0	0	0.0
$50,000 or more	4,275	252	5.9	2,872	146	5.1	313	0	0.0	934	107	11.5	156	0	0.0
Employment status															
Employed for wages	17,770	2,559	14.4	10,838	1,517	14.0	3,439	437	12.7	3,289	599	18.2	362	0	0.0
Self-employed	4,791	2,012	42.0	3,086	1,154	37.4	930	691	74.3	500	144	28.8	214	0	0.0
Out of work for more than 1 year	5,668	2,743	48.4	3,301	2,334	70.7	1,513	138	9.1	649	274	42.2	1,008	804	79.8
Out of work for a year	2,030	408	20.1	1,334	181	13.6	183	183	100.0	514	45	8.8	0	0	0.0
Homemaker	4,557	743	16.3	706	0	0.0	2,435	290	11.9	991	377	38.0	340	78	22.9
Student	7,304	1,293	17.7	4,204	845	20.1	2,392	0	0.0	709	449	63.3	0	0	0.0
Retired	4,182	422	10.1	1,702	121	7.1	1,242	301	24.2	504	0	0.0	566	0	0.0
Unable to work	2,678	378	14.1	972	0	0.0	396	377	95.2	1,214	0	0.0	96	0	0.0

*Transsexual population – No one interviewed in this population mentioned using tobacco. **LGBTT = lesbian, gay, bisexual, transgender, transsexual

Table 3. Prevalence of health conditions and risk factors in smokers, 2013–2015*

Variable	LGBTT-S** (N = 10,553) Yes		Gay-S** (N = 6,174) Yes		Bisexual-S** (N = 2,416) Yes		Lesbian-S** (N = 1,885) Yes		Transgender-S** (N = 882) Yes	
	#	%	#	%	#	%	#	%	#	%
Body mass index										
Underweight	517	4.9	0	0	515	21.3	0	0	0	0
Normal weight	4,411	41.8	2,186	35.4	1,648	68.2	500	26.5	882	100
Overweight	3,345	31.7	2,599	42.1	254	10.5	492	26.1	0	0
Obese	2,279	21.6	1,389	22.5	0	0	893	47.4	0	0
General health										
Excellent	1,905	18.1	701	11.4	598	24.8	284	15.1	218	24.8
Very good	1,044	9.9	702	11.4	903	37.4	306	16.2	330	37.4
Good	2,820	26.7	2,143	34.7	441	18.3	256	13.6	161	18.3
Fair	4,308	40.8	2,358	38.2	474	19.6	1,040	55.1	173	19.6
Poor	478	4.5	270	4.4	0	0	0	0	0	0
Health insurance										
Puerto Rico health reform	4,677	44.4	3,130	50.7	1,189	49.2	601	31.9	78	8.8
Private insurance	5,256	49.9	2,734	44.3	909	37.6	939	49.8	804	91.2
I don't have health insurance	600	5.7	309	5.0	317	13.1	345	18.3	0	0
Smoke the first cigarette of the day in the first half hour after waking (Yes)	5,566	53.6	3,439	55.7	1,329	55.0	976	51.8	0	0
Depressive disorder (Yes)	3,240	30.7	2,426	39.3	184	7.6	630	33.4	804	91.2
Heavy drinker (Yes)	2,374	22.5	1,222	19.8	771	31.9	362	19.2	0	0
Asthma (Yes)	2,068	19.6	920	14.9	667	27.6	479	25.4	0	0
COPD (Yes)	1,340	12.7	1,068	17.3	0	0	273	14.5	804	91.2
Angina or coronary heart disease (Yes)	1,192	11.3	840	13.6	290	12	66	3.5	804	91.2
Arthritis (Yes)	1,150	10.9	587	9.5	377	15.6	181	9.6	0	0
Diabetes (Yes)	1,055	10	926	15	0	0	173	9.2	804	91.2
Stroke (Yes)	295	2.8	0	0	290	12	0	0	0	0
Kidney disease (Yes)	137	1.3	62	1	0	0	0	0	78	8.8
Heart attack (Yes)	32	0.3	37	0.6	0	0	0	0	0	0

*Transsexual population – No one interviewed in this population mentioned using tobacco. **LGBTT-S = lesbian, gay, bisexual, transgender, transsexual people who smoke. Gay-S = gay men who smoke. Bisexual-S = bisexual people who smoke. Lesbian-S = lesbian women who smoke. Transgender-S = transgender people who smoke.

After performing a logistic regression adjusted by age and in terms of health conditions and risk factors, LGBTT-S were found to be more likely than LGBTT-NS to have depression (OR: 2.63, p = 0.030) (Table 4). Likewise, LGBTT-S were more likely than GP-NS to suffer from COPD (OR: 4.81, p = 0.014), depression (OR: 3.27, p = 0.002), and heart attack (OR: 0.12, p = 0.038) (Table 5). Finally, LGBTT-S were more likely than GP-S to suffer from COPD (OR: 5.07, p = 0.013) and heart attack (OR: 0.13, p = 0.046) (Table 6).

Table 4. Odds Ratio (OR) estimation, LGBTT-S vs. LGBTT-NS

Variable	Crude OR	p-value	CI 95%		Age-adjusted OR	p-value	CI 95%	
Heart attack	0.14	0.083	0.016	1.284	0.15	0.089	0.016	1.345
Angina or coronary heart disease	2.46	0.258	0.516	11.766	2.85	0.172	0.634	12.817
Stroke	11.72	0.085	0.712	193.036	12.13	0.07	0.818	180.033
Asthma	1.03	0.938	0.444	2.406	1.02	0.959	0.425	2.466
COPD	2.70	0.163	0.669	10.896	2.92	0.125	0.743	11.5
Arthritis	0.48	0.222	0.151	1.553	0.79	0.717	0.22	2.835
Kidney disease	1.53	0.623	0.279	8.374	3.21	0.256	0.428	24.156
Depression	2.48	0.040	1.042	5.907	2.63	0.030	1.098	6.296
Diabetes	1.69	0.371	0.531	5.435	2.39	0.155	0.719	7.976

Discussion

The LGBTT population is diverse and is represented in different social groups (14). However, the members of this population face a common set of challenges within the health care system (15). The lack of population estimates and the limited information about the health of LGBTT individuals make this population a challenge for the public health system. Conservative global estimates suggest that approximately 84 million people identify as sexual or gender minority individuals (16). United States population studies have estimated that 3.5% (approximately 9,000,000) of that country's total population is part of the LGB population (17,18). According to the results of our research, in Puerto Rico during the period of 2013 through 2015, 1.8% (48,980) of the population 18 years of age and over identified themselves as being part of the LGBTT population.

In the United States, tobacco use kills more people than do alcohol use, car accidents, suicide, AIDS, murder, and illegal drug use, all

Table 5. Odds Ratio (OR) estimation, LGBTT-S vs. GP-NS

Variable	Crude OR	p-value	CI 95%		Age-adjusted OR	p-value	CI 95%	
Heart attack	0.05	0.004	0.007	0.390	0.12	0.038	0.016	0.885
Angina or coronary heart disease	1.20	0.803	0.283	5.104	2.23	0.296	0.494	10.106
Stroke	1.19	0.861	0.163	8.754	2.65	0.346	0.349	20.221
Asthma	1.13	0.745	0.534	2.399	1.02	0.957	0.475	2.196
COPD	3.37	0.053	0.986	11.505	4.81	0.014	1.374	16.83
Arthritis	0.24	0.010	0.079	0.711	0.57	0.325	0.189	1.737
Kidney disease	0.38	0.186	0.090	1.597	0.61	0.501	0.148	2.545
Depression	2.51	0.014	1.208	5.202	3.27	0.002	1.559	6.846
Diabetes	0.75	0.601	0.254	2.208	1.69	0.383	0.518	5.534

Table 6. Odds Ratio (OR) estimation, LGBTT-S vs. GP-S

Variable	Crude OR	p-value	CI 95%		Age-adjusted OR	p-value	CI 95%	
Heart attack	0.81	0.015	0.011	0.609	0.13	0.046	0.016	0.962
Angina or coronary heart disease	2.02	0.349	0.464	8.766	2.83	0.176	0.628	12.731
Stroke	1.15	0.892	0.152	8.687	1.99	0.513	0.253	15.594
Asthma	1.04	0.917	0.483	2.247	0.91	0.812	0.401	2.044
COPD	3.63	0.044	1.034	12.736	5.07	0.013	1.408	118.273
Arthritis	0.42	0.125	0.138	1.274	0.72	0.573	0.236	2.224
Kidney disease	0.73	0.677	0.161	3.272	1.34	0.706	0.286	6.349
Depression	1.59	0.220	0.755	3.350	1.74	0.148	0.822	3.683
Diabetes	1.13	0.826	0.379	3.373	1.91	0.288	0.579	6.273

combined, each year (18). The scientific literature shows that the burden of tobacco-related morbidity and mortality is not equally distributed across different population groups (19). Multiple factors have been identified as contributing to the vulnerability of the members of the LGBTT population, in terms of tobacco use. Those factors include stress related to homophobia, discrimination (20,21), the direct marketing campaigns of tobacco companies, and lack of access to health care (8).

In Puerto Rico, this is the first research who analyze population-based data for 3 consecutive years with respect to tobacco use in, the health conditions of, and risk factors in the members of the LGBTT population. As we mentioned in the introduction, the scientific literature demonstrates that the LGBTT population has a higher tobacco use prevalence than does the straight adult population (6,7,8,9,10,11). The results of our research are compatible with these findings. The Puerto Rico LGBTT population had a higher tobacco use prevalence than did the general-population (21.6% vs. 10.8%). Furthermore, the current scientific literature demonstrates that the prevalence of tobacco use is particularly high among bisexual adults. Some state surveys have found prevalence of tobacco use between 38 to 39% in this part of the LGBTT population (8). In our research, bisexual adults had the lowest tobacco use prevalence (19.5%) compared with the prevalence of the other groups of the LGBTT population. Otherwise, few studies have measured tobacco use in the transgender population, but only one of these studies evidenced a high tobacco use prevalence (30.5%) in this population (8). In our research the transgender population had the highest tobacco use prevalence (34.1%) in comparison with those prevalences of the other groups.

Members of the LGBTT population are facing health disparities related to social stigma, discrimination, and the denial of their civil rights (3). Likewise, poor knowledge of a given patient's sexual orientation on the part of health care personnel, ignorance of the specific health care issues that pertain to the members of the different LGBTT populations, and the fear that many health care workers are homophobic mean that multiple health risks faced by LGBTT individuals are not properly addressed (22). Some groups within the LGBTT population are less likely than is the population at large to have access to or use general medical facilities that offer effective smoking-cessation services (23). In terms of tobacco use, the scientific literature shows an association between disproportionate prevalence of smoking and disproportionate odds of illness. (19). Further, estimates indicate that more than 30,000 LGBTT persons die each year of tobacco-related diseases (24). In our research, when the age-adjusted ORs were estimated for health conditions and risk factors, LGBTT-S are 2.63 times more likely to have depression than the LGBTT-NS. Furthermore, LGBTT-S were found to be 4.81 times more likely to suffer from COPD, 3.27 times more likely to suffer from depression, and 0.12 times more likely to have had a heart attack than were GP-NS. Finally, LGBTT-S were found to be 5.07 times more likely to suffer from COPD and 0.13 times more likely to have had a heart attack than were GP-S.

Another important finding of our research was that 53.6% of LGBTT-S reported smoking the first cigarette of the day during the first half hour after waking up. When we analyzed this variable by group, the prevalence of this behavior fluctuated between 51.8% to 55.7%. TTFC is part of the Fagerstrom Test for Nicotine Dependence and is an objective measure of nicotine dependence (25 24). This measure is associated with other behavioral traits of nicotine addiction, including smoking amount, inability to quit, smoking relapse, and tolerance (25,26). Muscat et al. (2011) found that the risk of lung cancer was nearly doubled in smokers who smoked their first cigarette within 30 minutes after waking (25). At the same time, Muscat and his team also found in another study published in 2011 that the first cigarette of the day was significantly associated with an increased risk of head and neck cancer (26). Therefore, this important risk factor must be included in future research related to tobacco use and the LGBTT population.

Finally, the results of our study revealed a disproportionate use of tobacco in the LGBTT populations of Puerto Rico compared to such use in the general-population. The results also demonstrated that LGBTT-S were more likely to have some health conditions or risk factors compared with LGBTT-NS, GP-NS, and GP-S. The current scientific literature shows that LGBTT-S, as do heterosexual smokers, generally attempt to quit smoking unassisted (27). For that reason, specific interventions and treatments directed to the LGBTT population and its different groups are needed to help to reduce the impact of this addiction on their health. Increasing the availability of evidence-based treatments for the LGBTT population is critical if their high rates of tobacco use are to be reduced (28,29).

This research had 3 main limitations: The Behavioral Risk Factor Surveillance System is a self-reported survey, and some respondents have the tendency to underreport some behaviors that may be considered or may be, in fact, socially unacceptable, unhealthy, or illegal. The data collection was limited to a single time point (cross-sectional design), this limits the ability to determine causality. Finally, the research outcome only applied to members of the LGBTT population who lived in Puerto Rico at the time of the survey.

Resumen

Objetivos: Los objetivos de esta investigación fueron desarrollar un perfil epidemiológico del uso de tabaco en la población de lesbianas, "gays," bisexuales, transgeneros y transexuales (LGBTT) de Puerto Rico e identificar si existen diferencias estadísticas significativas en términos de condiciones de salud y factores de riesgo entre la población LGBTT fumadora (LGBTT-F), la población LGBTT no fumadora (LGBTT-NF), la población general no fumadora (PG-NF) y la población general fumadora (PG-F). Métodos: Utilizando el "Sistema de vigilancia de factores y conductas de riesgo de Puerto Rico 2013-2015 (PRBRFSS por sus siglas en inglés)", se realizó un análisis univariado para obtener el perfil epidemiológico y un análisis bivariado para comparar la población LGBTT-F, LGBTT-NF, PG-NF, y PG-F. Finalmente, para determinar la posibilidad de riesgo (OR por sus siglas en inglés), se utilizó un modelo de regresión logística ajustado por edad con 95% de confiabilidad. Resultados: Durante el 2013-2015 la población LGBTT de Puerto Rico reportó mayor prevalencia de uso de tabaco que la población general (21.6% vs. 10.8%). La población LGBTT-F demostró mayor probabilidad de tener depresión (OR: 2.63, p=0.030) que la población LGBTT-NF. La población LGBTT-F demostró mayor probabilidad de tener COPD (OR: 4.81, p=0.014), depresión (OR: 3.27, p=0.002) y ataque al corazón (OR: 0.12, p=0.038) que la PG-NF. Finalmente, la población LGBTT-F demostró mayor probabilidad de tener COPD (OR: 5.07, p=0.013) y ataque al corazón (OR: 0.13, p=0.046) que la PG-F. Conclusión: Los resultados demostraron que el consumo de tabaco es uno de los problemas de salud pública más críticos que afectan a la población LGBTT. Por tal razón, se necesitan intervenciones y tratamientos específicos dirigidos a la población LGBTT y sus diferentes grupos para ayudar a reducir el impacto de esta adicción en la salud de esta población.

Acknowledgments

The authors wish to acknowledge Ruby A. Serrano, DrPH, Director of the Puerto Rico Behavioral Risk Surveillance System, for providing the data used in this research.

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